8. Weishaupt. Arbeiten Path. Institut. Tübingen, Bd. i. Heft 1.
9. Fischer, F. Deutsch. Zeitsch. f. Chirurg., 1893, Bd. xxxvi. Heft 3–4.
10. Ricker. Langenbeck's Archiv., 1895, Bd. l.
11. Dietrich. Beitr. z. klin. Chirurg., Bd. xvi. 2.
12. Lewis, Charles H. Medical Record, August 28, 1897.
13. Traversa, F. Ref. Baumgarten, Jahresber. 1893, ix.
14. Verdelli. Ref. Baumgarten, Jahres. 1893, ix.
15. Gram, Ch. Ref. Baumgarten, Jahres. 1894, x.
16. Grossi, C. La Riforma Med., 1893. 156–157.
17. Bonvicini, A. Bologna, 1896.
18. Lesage. Compte-Rendus Soc. de Biol., Paris, December 24, 1892.
19. Vehsemeyer. München. Med. Woch , 1893, No. 30.
20. Delbert, P. Compte-Rendus de l'Acad. des Sciences, 1895, No. 24.
21. Mannaberg, J. Verhand. f. des Cong. f. Innere Med., 1896.
22. Kovàcs. Wien. klin. Woch., 1893, No. 40.
23. Miller, H. F. Deutsch. Archiv. f. klin. Med., Leipzig, 1892, l, 47–81.
24. Nash, W. G. British Medical Journal, 1892, ii. 1054.
25. Gumprecht. Central. f. allg. Path. u. path. Anat., 1896, vii. 20.
26. Kuhnau, W. Central. f. allg. Path. u. path. Anat., 1896, vii. 14.
27. Fraenkel, A. Deutsch. med. Woch., 1895, 39–43.
28. Richter, P. F. Zeitsch. f. klin. Med., xxvii. 3 and 4.
29. Levy, A. M. Virchow's Archiv, 1898. 125. 1
30. Volpe, A. Arch. internaz. di Med. e. Chir., Napoli, 1896, xii. 161–175.

GASTROPTOSIS: REPORT OF A CASE IN WHICH A NEW OPERATION WAS UNDERTAKEN AND THE PATIENT GREATLY IMPROVED.

By Alfred Stengel, M.D.,

and

Henry D. Beyea, M.D.,
of Philadelphia.

The following case is an instance of enteroptosis, or Glenard's disease, in which there was downward displacement of the stomach, intestines, and right kidney. The patient was a young, unmarried woman. There was no history of traumatism, nor of illness, nor of abdominal distention by pregnancy or fluid effusion to explain the displacement of the organs. The cause, therefore, must be considered as most probably compression of the thorax by tight clothing and relaxation of the ligaments. There was not rapid emaciation. A first operation (nephrorrhaphy) was undertaken in the hope that the gastric symptoms would subside with relief of the renal displacement. There was decided improvement, but the distinctly gastric symptoms continued, and notwithstanding prolonged rest and careful diet no relief was obtained. At this time the late Dr. William Pepper, under whose care she was, and one of the writers who had immediate charge of her case, discussed the advisability of operative interference, unaware of the fact that operative treatment had been suggested and accomplished in a few cases. In this discussion the possibility of fully restoring the stomach was carefully considered, and the only suggestion that presented itself, viz., attachment of the stomach to the anterior abdominal wall, was abandoned, because we were aware of the frequency of unpleasant symptoms in cases of adhesions of the hollow viscera of the abdomen. A second suggestion—that of gastroplication in the dependent part of the organ near the pylorus—was entertained, because we felt that the symptoms of distress, etc., might be connected with strain upon this part of the muscle of the stomach. It is not unlikely that severe strain would fall upon this part, which is the most active part (in a motor sense) in health, and in gastroptosis, the most unfavorably situated, and therefore the most prone to dilatation. If, then, an infolding of this part of the organ could be effected, and thereby the burden of the motor activity transferred to a part of the organ nearer the fundus, relief might possibly be secured for a time at least. At this point in the study of the case Dr. Beyea was called in, and suggested what appeared to us a better procedure than either of those named, and the case was submitted to him for operation. The operation will be described below. The history of the case is as follows:

Mary A., aged twenty-five years, white; no occupation; home in New Jersey; was admitted April 2, 1897.

History. Father living and enjoying good health at the age of sixty-four years. Mother died at the age of fifty-eight years. Three brothers living and well, as is also one sister. One brother died at the age of thirty-eight, of unknown cause. She believes it to have been stomach trouble.

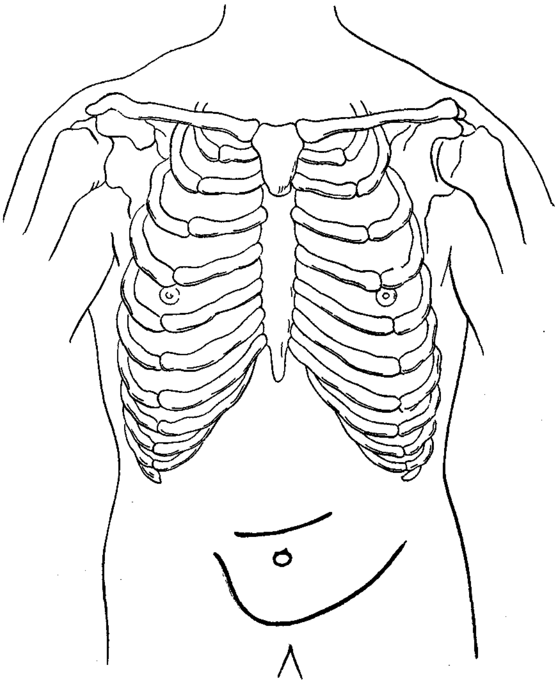
The patient had scarlet fever and whooping-cough during childhood, but since then she had enjoyed the best of health until February, 1893, which was the beginning of her present illness.

There was no history of traumatism.

In February, 1893, she noticed that immediately after eating she would have eructations of wind, lasting about two hours. The more food she ate the worse would be these eructations, and no matter what kind of food she took the eructations occurred. She occasionally had a dull pain or ache in the right flank. At present she does not complain of actual pain over the stomach, though it is at times tender on pressure. The patient has always had a good appetite. The bowels are very constipated. She has not led a sedentary life, but has always taken plenty of exercise, and she was always careful in eating, and masticated her food thoroughly.

Physical Examination. Chest ill-developed, long and narrow, especially below. The heart-sounds are normal. The lungs exhibit no abnormalities except slight "cog-wheel" breathing at the left apex. The abdomen is somewhat sunken in the epigastrium. At the umbilicus and down to two and one-half inches below it, and extending three inches to the left and one inch to the right of the middle line, is a protuberance, soft and elastic on palpation, not tender, and giving the impression of a stomach distended with gas. There is some tenderness in the epigastrium, and just under the ribs on the right side, as well as in the region of both kidneys. The right kidney is readily palpable, dislocated somewhat downward, seems a little enlarged, is very tender on deep pressure, and is quite freely movable for an inch or more. The left kidney is not palpable. The hepatic and splenic dulness are normal. On auscultatory percussion the stomach outlines reach from one-half inch above the umbilicus (the lesser curvature) to a point two-thirds the distance from the umbilicus to the pubes (the greater curvature). The right border is an inch and a half to the right of the umbilicus; the pylorus apparently at the same distance to the right and a little above the umbilical level. (Fig. 1.) The left border is on a line with the anterior axillary fold. On distending the stomach, the outlines were found to correspond with the above description. Air passes the pylorus readily. There is no palpable growth.

FIG. 1.



Position of the stomach, April, 1897.

Three and one-half hours after a breakfast (consisting, however, of bread and coffee only) the stomach contained no remnants of the meal.

One hour after an Ewald meal, 125 c.c. of contents were obtained, containing a good deal of poorly-digested bread. Free HCl was present in slight amount. The total acidity was a little low—28. No lactic acid.

The urine and the blood were found normal.

April 8th. Six and one-half hours after a test dinner, consisting of a small Hamburg steak, two slices of bread, and 200 c.c. of water, 20 c.c. of thick contents were easily removed, after which the tube became blocked with small shreds of meat. Lavage brought out several more shreds of meat and considerable fluid contents. The undiluted contents contained free HCl in quantity, and had the very high acidity of 116. There was no Uffelmann reaction for lactic acid. Much half-digested food was present.

10th. A gynecological examination made to-day by Dr. Penrose was negative. She has a very distinct jaundice to-day. Sclerotics look very yellow. Bowels costive and stools clay-colored. Otherwise she feels the same.

12th. Jaundice persists about the same in intensity, and stools are the same. Her other symptoms are not changed.

15th. Jaundice is very much less, but still is noticeable.

During this time the urine was repeatedly examined and was practically normal, though a little too concentrated.

18th. The jaundice has disappeared.

21st. Operation (by Dr. J. William White) in his clinic; nephrorrhaphy of the right kidney. The usual incision was made in the right loin, and on exposing the kidney it was found to be quite freely movable. It was then sutured in place in the usual manner and the wound closed and dressed antiseptically without drainage.

24th. Patient complains of a great deal of pain at the site of operation. A little albumin was found in the urine in two examinations after the operation, but there were no casts.

27th. Wound dressed to-day and is entirely healthy.

28th. Some slight temperature, which is due to tonsillitis.

30th. Temperature again shows a tendency to fall, and she feels very comfortable.

Soon after this the patient left the hospital.

Physical Examination on Readmission, October 9, 1897. The general appearance is distinctly improved. She looks heavier and has a better color. The examination of the chest organs shows entirely normal physical signs. The abdomen shows the same appearance as when last in the hospital. There is a prominence from an inch above the umbilicus to within an inch and a half of the pubis, which is roughly of the shape of the stomach, is tympanitic and elastic. Percussion and auscultatory percussion indicate more strongly that this is the descended stomach, of about normal size, and inflation confirms this and shows that the location and outlines of the organ are not changed since her discharge. The liver and spleen are of normal size and in normal position. The left kidney seems indistinctly palpable, but not movable. The right kidney is readily palpable, and is below its normal position by one inch or more.

12th. Lavage four and one-half hours after administration of a test dinner of Hamburg steak, a roll, and a glass of milk showed a considerable retention of fairly well-digested meat. The stomach walls are lax, and the fluid flows in readily and is returned by siphonage very slowly. A quart and a half of water is retained at a time, and the walls can be well distended with air without causing distress.

14th. She shows no change in condition or symptoms. Has a good deal of burning in lower epigastrium, usually several hours after meals. She has irregular, tender joints and complains of a "weak" and hollow feeling.

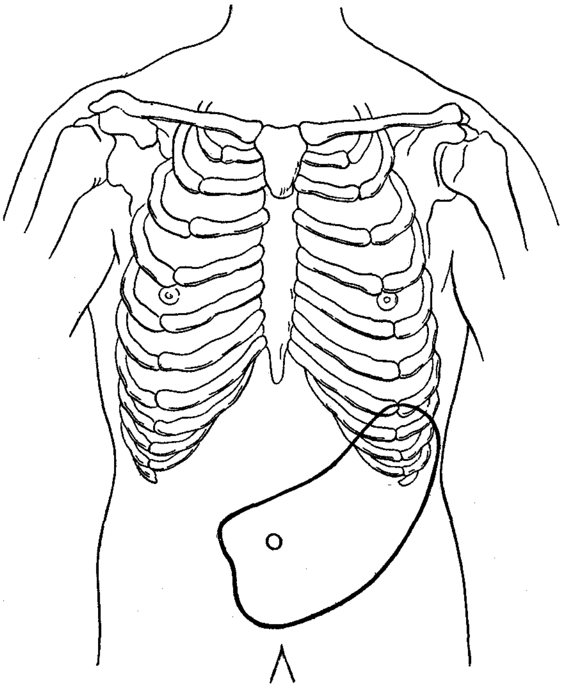
Third Admission (April 11, 1898). Her general appearance is distinctly improved. She has a better color, and has apparently gained flesh.

She complains of the same old trouble returning. Has a good deal of pain at irregular points over the abdomen, and especially some hours after meals there is a burning pain about the umbilicus, and distention with gas, and belching.

The right kidney region is often painful. The kidney may be felt somewhat below the normal position, but it is slightly if at all movable. The left kidney is not distinctly palpable.

The stomach is seen, upon simple inspection, in the same position as before. Upon percussion, however, and especially upon percussion after inflation, there seems to be some increase in the size of the organ. The pylorus is at least two and one-half inches to the right of the umbilicus, and nearly on a level with it. (Fig. 2.) The portion of the stomach lying to the right of the umbilicus is distinctly enlarged, and when distended the vertical width of the stomach extends from one and one-half inches above the umbilicus to about one and one-half inches above the pubis. The fundus reaches up to the sixth rib in the anterior axillary line or a little anterior to that line.

FIG. 2.



Position of the stomach during the third visit to the hospital (April, 1898), just before operation.

The patient was now transferred to the gynecological wards, and the operation was performed on April 19, 1898.

Operation. The patient, after having been prepared for the operation of cœliotomy and anæsthetized, was placed upon the Boldt operating-table in a position opposite to that employed for operation through the lower portion of the abdomen. The object of this position was to permit the elevation of the chest and upper portion of the abdomen, which would allow the gravitation of the intestines and stomach out of the field of operation, and give the greatest operative space, in order to gain every advantage of the Trendelenburg position. The skin of the abdominal wall was then scrubbed with green soap and water, ether and alcohol, and the field of operation surrounded by sterilized towels. An incision about four inches in length was made through the linea alba, midway between the xiphoid cartilage and the umbilicus. The tissues were separated in the usual manner and the peritoneal cavity opened, exposing a small portion of the upper curvature and cardiac end of the stomach, the gastro-hepatic omentum, the gastro-phrenic ligament, and the lower portion of the liver. The table was then elevated to the Trendelenburg position, and the stomach displaced still further downward and out of the wound by means of gauze sponges. This procedure caused the gastro-hepatic omentum and gastro-phrenic ligament to be slightly stretched and separated from the underlying structures, which permitted an accurate determination of the length of the gastro-hepatic omentum and very much facilitated operative manipulation. The gastro-phrenic ligament was seen to be well developed, and evidently formed a strong support for the cardiac end of the stomach, while the other portion of the gastro-hepatic omentum was composed of thin, delicate peritoneum, but was determined to be of sufficient textural strength to hold sutures, and also gave much support. Retractors were now introduced and the liver held aside by the fingers of an assistant. Interrupted sutures were next introduced to shorten the gastro-hepatic omentum in the following manner: The first suture caught the gastro-phrenic ligament above at a point as near as possible to the diaphragm (a distance of about two inches from the diaphragm) and below, just above the gastric vessels. After this suture had been placed the gauze sponges which displaced the stomach were removed and the suture temporarily tightened, so as to determine the height to which the stomach could be brought by this manner of suturing and the degree of support which would be furnished to the stomach. This having been determined to be satisfactory, the stomach was again displaced out of the wound and the suturing continued. The second suture was introduced through the gastro-hepatic omentum opposite, and about one-fourth of an inch from the first one, followed by a row of eight or ten others introduced in the same way, to include the left three-fourths of the gastro-hepatic omentum. In order to be sure of gaining a wide surface of adhesion, particularly in relation with the gastro-phrenic ligament, three or four more sutures were introduced, which included the peritoneum above and below those already placed. The gauze sponges were again removed, and the first and then the second row of sutures were tied, forming a tuck in the gastro-hepatic omentum and gastro-phrenic ligament. After this had been accomplished the stomach was seen to occupy what was thought to be a normal position. All gauze sponges were then removed from the abdominal cavity and the table lowered until the patient was in a horizontal position. The wound was closed by suturing the peritoneum with fine silk, the fascia with silver wire, and the skin with fine silk, with an intracutaneous stitch. The wound was dressed with two layers of sterile gauze held in position by antisepticized colloidon, covered by several more layers of sterile gauze. In order to assist in giving support to the stomach and aid in preventing traction upon the sutures during the early part of convalescence a large compress of gauze and cotton was placed over the lower two-thirds of the abdomen, and the dressings and compress held in place by a many-tailed flannel binder.

Fine silk was employed for suturing the gastro-hepatic omentum and gastro-phrenic ligament. The needles were small, curved, and round-pointed. This particular form of needle was selected to prevent tearing the tissue in the introduction of sutures. In introducing the needle care was taken to introduce the stitches evenly and accurately without causing tension. Each suture also caught the greatest possible amount of tissue practicable, in order to give the greatest strength and form a wide adhesion.

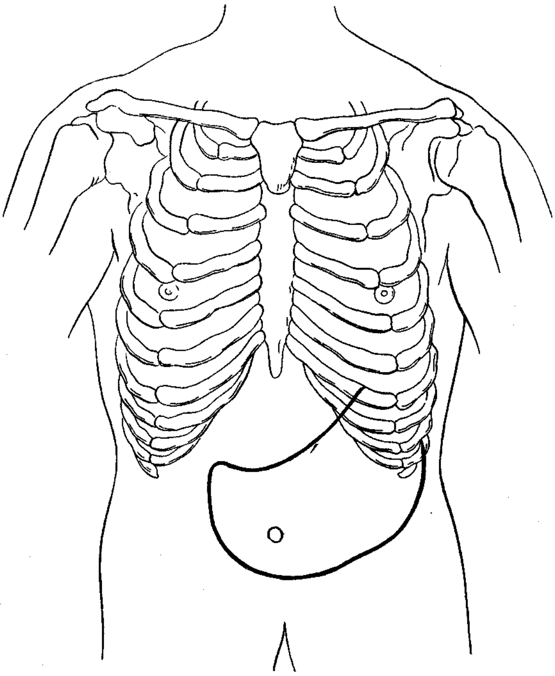
After the operation, which lasted forty minutes, the patient was returned to bed in good condition, the pulse being 98 and the temperature 97° F. She made a normal convalescence. After the first five hours the pulse was never more frequent than 78, and the temperature but once reached 100° F. She was given nothing by the mouth for forty-eight hours except small amounts of hot water, at the end of which time drachm doses of milk and lime-water began to be administered hourly. The amount of milk was gradually increased after twelve hours, until, on the fifth day after operation, she was taking five drachms of peptonized milk every hour. The bowels were opened by an enema thirty-six hours after operation. She was kept in bed and upon her back until June 28th, and left the hospital on July 1st.

After her discharge from the hospital she wrote us from time to time about her condition. After a sufficient time had elapsed we requested her to return to us for examination. The results of this examination are recorded in the next paragraph.

November 10, 1898. The patient visited the hospital to-day, reporting a gain of ten pounds in weight, and was feeling somewhat better than previous to the operation. A stomach-tube was inserted and the stomach inflated with air. This showed that the lesser curvature was still well supported, and the greater curvature did not extend more than an inch and a half below the umbilicus, taking the lowermost border of the sloping projection caused by the inflation as the situation of the greater curvature. (Fig. 3.)

March 14, 1899. The patient again returned to the hospital upon our request, and states now that she is very much better, and has gained nine pounds since her last visit. She is able to eat freely without discomfort, has a distinctly better appetite, and feels inclined to do more work about the house. The stomach was inflated with air and was found to occupy exactly the same position as that discovered at the last examination. Palpation of the kidney reveals the fact that it has been sustained in its normal position. Twenty-four ounces of water were then allowed to flow through the stomach-tube, when the patient complained that the stomach felt full. The tube was carefully removed, and the gastro-diaphane was inserted. When the light was turned on a bright spot of illumination was observed (umbilicus) and diffuse illumination of the area, which had been prominent upon inflation, and having almost the same superficial boundaries. The results of this examination were, upon the whole, unsatisfactory on account of the haziness of the outline of the light and the changed relations with changes in position of the patient and changes in the tube within the stomach.

FIG. 3.



Position of the stomach November 10, 1898, and March 14, 1899.

We have made a careful search through medical literature to determine what operative measures have been used for the relief of this condition, and have found the cases which are abstracted below. It will be observed that in none of these was the operation exactly similar to that which we undertook, although one of the operators (Davis) describes a very similar operation for the relief of descent of the small intestine which accompanied the gastroptosis.

Treves[1] records an interesting case, as follows: The patient, a young lady, aged twenty-two years, had been ill for six years. She was highly cultivated, but had never been considered as a neurotic subject, nor did she appear so. The illness began six years before with an acute abdominal disturbance, supposed to be an ulceration of the stomach or intestine. The symptoms rather pointed to an intestinal trouble, as far as could be made out from the story of the patient. There had been a fall previous to this illness, and she never fully recovered after it. The symptoms in general were those associated with Glenard's disease. Abdominal pain was almost constant, vomiting was common, and the vomited matter was intensely acid. She was much worse when in the upright position. A right floating kidney had been discovered and had been fixed in place by a surgeon three years before, and it still remained in good position. The rest treatment was tried, but the patient grew worse under it. Finally she had found relief by wearing a belt, but the latter had to be made increasingly stronger to support the viscera. Treves operated in June, 1895. The abdomen was opened in the middle line a little below the xiphoid cartilage. The liver was found presenting at the wound, and the stomach occupied a lower level than usually, but it was impossible to drag it upward. This was found to be due to the fact that the greater omentum was rolled up into a rigid cord, which was fixed to a mass of stony hardness in the right iliac region. A second incision was made over this mass, and it was found to be a collection of old, tuberculous glands. These were at once removed. The stomach then became movable. The liver was secured in place by ligatures. These concerned the lines of the falciform ligament and the umbilical fissure, the most important stitch being passed through the liver near its edge and penetrating the round ligament. The other stitches involved the round ligament and the falciform ligament. Above, the sutures were passed through the fibrous tissue of the abdominal walls at the side of the xiphoid cartilage. The patient made an excellent recovery without complications, excepting a small stitch abscess, and the troubles depending upon the ptosis of the viscera disappeared. She was able to walk without discomfort. The gastric symptoms almost disappeared, and five months after the operation, when the patient left England, the only complaints were of weakness and of some intestinal pain which may have been due to adhesions.

---

[1] British Medical Journal, January 4, 1896.

Duret[1] describes a case of gastroptosis in which he performed a novel operation, which he designates "gastropexie." The patient was a woman, aged fifty-one years, who had been in good health up to a comparatively recent period. She was married at twenty-two years of age and had two children. She had had some nervous symptoms which were attributed to cervical metritis and displacement of the uterus. Three years before she came under observation she had suffered with bad digestion, due to dietary irregularities. The symptoms of gastric disturbance coincided with the first days of her periods. The dyspeptic troubles increased, and she lost weight, the decrease amounting to seventeen and one-half kilos. No improvement followed treatment of various kinds, and she came under the author's care in a much emaciated state, though her face did not show the evidence of severe disease, the skin having a rather healthy color. The abdomen was hollow, and on palpation in the iliac fossa the cæcum could be found distended with fecal matter. In the left iliac fossa he discovered a hard mass, which could be rolled under the finger, and which was the sigmoid flexure turned upon itself, small in size, not being larger than the index-finger. The transverse colon could not be plainly palpated. The liver was moderately depressed or enlarged; it extended about the width of the finger below the ribs. The spleen was not accurately delimited. In following the procedure of Glenard he could not determine any movability of the right kidney. On percussion the epigastric region was hollow, and superficial palpation determined the aortic contractions very plainly. The stomach could not be delimited by percussion, but on examining the splashing sounds it was discovered that the greater curvature extended to a point about four fingers' breadth above the pubes. Lavage of the stomach was practised, partly as a therapeutic measure and partly for diagnostic purposes, and it was found that it was possible to introduce a quantity of water, amounting to a litre and a quarter, without producing a tendency to vomiting. It was finally concluded to undertake an operation, and the author proceeded as follows:

---

[1] Revue de Chirurgie, 1896, p. 421.

After abdominal incision was made from a little below the ensiform cartilage downward 8 or 10 cm., sparing the peritoneum in the upper end of the incision, sutures were inserted through the peritoneal reflection of the stomach, at the junction of the lesser curvature and anterior wall of the stomach and through the peritoneum in the upper angle of the superficial wound, and the stomach thus fastened in place. The abdominal wound was then closed. The patient's general condition improved very much after the operation, and she was finally discharged, having begun to take ordinary food. The functions of the bowels were normal. Digestion was no longer painful. The tongue was clean, and she was able to take all sorts of food, including bread, which had been very difficult to digest before. She had gained in weight.

Byron B. Davis[1] records two cases in which operation was undertaken for the relief of gastroptosis. With regard to the diagnosis, he states that "if the lesser curvature is found half-way or more from the ensiform cartilage to the umbilicus, no doubt can exist that ptosis not only of the stomach but of the intestines is present." Some form of treatment must be devised which will support the displaced parts, and the functions of the intestines must be regulated in some way. He notes that the only surgical procedures undertaken prior to his report were gastropexy and gastrorrhaphy. Shortening the mesentery, which is the method pursued by himself, had not been attempted before, nor had shortening of the gastro-colic omentum been practised.

---

[1] Western Medical Review, October 15, 1897.

Case I.—A farmer, aged sixty-three years, presented himself with a large abdominal hernia, extending from two inches above the umbilicus to the symphysis. When he stood erect the recti separated for a distance of three or four inches, and a considerable part of the abdominal contents was extruded. This hernia made its appearance six or seven years before, and was caused by a laparotomy for the relief of an omental or intestinal tumor. The patient suffered with pain in the umbilical region and great discomfort in the lower part of the abdomen when he stood erect. There was also a left inguinal hernia. An attempt to cure both herniæ was made in February, and when the patient returned in July there was no recurrence of the herniæ, but he still had great discomfort and pain in the umbilical region, and it was supposed that adhesions had re-formed. The following operation was undertaken: A median incision was made from near the ensiform cartilage to an inch below the umbilicus. The adherent omentum was detached and a part ligated and removed. Then the stomach was drawn up into its natural position, and the lesser omentum near its reflection from the stomach was fastened to the peritoneum near the ensiform with fine silk sutures. The stomach was not greatly dilated, the transverse colon was fully six inches below the greater curvature, and a tuck was taken in the gastro-colic omentum, the bloodvessels being carefully avoided by the sutures. This procedure shortened the distance between the colon and stomach to two or three inches. The small intestines were brought forward, and the mesentery was found to be so much elongated that the loops of intestine could be raised four or five inches above the abdominal wall without great tension on the mesentery. In order to shorten the latter without interfering with its blood-supply he used a long needle with No. 4 silk, inserted the needle near the apex of the mesenteric triangles representing the mesentery between neighboring arterial branches, penetrated the mesentery, and brought the needle through in the opposite direction at the centre of the base of the triangle formed by its intestinal attachment. The suture being tied, a reef was thus secured in the mesentery, shortening it from two to three inches. The circulation was not impaired in the least. Sutures were thus used the entire length of the small intestine, not in every interarterial space, but almost as close as that. Altogether ninety-two sutures were inserted between the upper jejunum and the iliocæcal valve. The patient recovered with practically no shock from the operation, and did well. The bowels moved on the third day, and on the twentieth day the patient was out of bed, and left the hospital four weeks from the day of the operation. There was apparent improvement at the time of the report, in September, 1897.

Case II.—Mrs. P., aged thirty years, the mother of two children, had suffered for two or three years with great distress after eating, and on standing she felt a downward pressure and bulging in the lower abdomen. There was obstinate constipation, great headache, and nervousness. The liver dulness was found to extend downward one and one-half inches below the ribs. The lesser curvature of the stomach was an inch above the umbilicus. The motor power of the stomach was normal and the examination of the gastric contents showed normal conditions. The patient had been operated upon previously for the repair of the cervix and a torn perineum, but was practically unimproved. On September 4, 1897, an operation was undertaken for the relief of the gastric dislocation. The stomach was found as previously outlined. The lesser omentum near its attachment to the stomach was stitched to the peritoneum on a level with the ensiform cartilage; and at the same time, as the stomach was considerably dilated, gastrorrhaphy was performed, thus serving the double purpose of reducing the size of the stomach and raising the transverse colon. The operation required one hour, and there was no shock from it. The bowels moved on the third day, and on the ninth day the dressings were changed and the sutures removed.

Ferrari,[1] in discussing gastroenterostomy in the treatment of ectasia and ptosis of the stomach, advocates gastroenterostomy under certain circumstances in the latter condition.

In the discussion Nicomi expresses opposing views, and advises only gastroplication.

Hannecart[2] describes a case of marked splanchnoptosis and relaxation of the abdominal walls upon which Depage operated with success. The operation was as follows: A transverse incision was made from the end of the eleventh rib to the opposite side at the same point. Two converging incisions were made from the ends of this obliquely downward to about the horizontal level of the umbilicus, where they were about 5 cm. distant from the middle line. From these points two arched incisions were made, which united in the neighborhood of the symphysis. After the skin of this part was separated, the linea alba, together with the edges of the rectus muscle and the peritoneum, were extirpated. The parts were brought together in a T-shape, and thus the abdominal wall was narrowed in a vertical as well as a transverse direction. The suspensory ligament of the liver was fastened in the upper angle of the wound, and thus the liver was fixed in its normal position.

Terrier and Hartmann[3] record a case, as follows: A woman, aged thirty-one years, had been ill for two years, her sickness having commenced by inability to take wine, the taking of the least quantity of this causing severe pain. She had intense constipation, some purgative being invariably necessary to secure a movement. When she came under observation she was cachectic in appearance, and on distention of the stomach this organ was found dilated and dislocated in a downward direction. The dilatation, as figured in their cuts, involved the pyloric end of the organ mainly, and was of the form alluded to in our discussion of dilatation secondary to dislocation. The operation, performed by Dr. Hartmann, was a combined gastrorrhaphy and gastropexy. A number of parallel sutures were fastened in the dilated pyloric end of the stomach, so as form a plicatio, and the whole organ was then elevated and fastened to the abdominal walls. She was carefully fed for a time after the operation, and her general condition improved greatly. Three weeks after the operation inflation of the stomach showed it to be in the normal position. From October 12th, the day previous to the operation, to January 10th she gained fourteen and one-half kilos.

---

[1] Revue de Chirurgie, 1897, vol. xvii. p. 337.

[2] Journal Méd. de Bruxelles, 1898, No. 8.

[3] Chirurgie de l'Estomac. Paris, 1899.

AN OUTLINE OF SOME OF THE MEDICAL USES OF THE RÖNTGEN LIGHT.

By Francis H. Williams, M.D.,
OF BOSTON.

The subject of X-ray examinations in medical practice has developed to such an extent that it cannot be fully presented in a short paper. Two courses lie open: either to take up a single disease and discuss it in detail or to go over a number of diseases briefly. It has seemed to me that at the present time the latter would be the more acceptable course. I shall, therefore, present the results of the clinical observations made in some of the patients I have examined in order to suggest ways in which an X-ray examination may corroborate other evidence or assist us to an earlier or to a more correct diagnosis, and I will leave the fuller discussion of them for another occasion.

In a general way X-ray examinations may be said to have thus far been most used to detect foreign bodies or changes in shape and composition of bones, as in fractures, dislocations, necrosis, tuberculosis, rickets, and osteomalacia.

Gouty deposits about the joints, as shown by Dr. Arthur L. Fisk, are distinguished from rheumatoid arthritis by means of an X-ray photograph.

The stomach may be examined by giving the patient a large dose of subnitrate of bismuth (which the X-rays do not easily traverse) with food and then looking at the shadow of its contents by means of the fluoroscope. (Fig. 1.) I have also taken in this way an X-ray photograph of the stomach.

Carcinoma. In the cases of carcinoma of the stomach that I have examined with the fluoroscope if the growth could be seen it could be felt. I have taken one X-ray photograph of a carcinoma of the stomach and its thickest portions, as shown at the operation, corresponded to a dark area shown in the photograph and seen in the fluoroscope.

Ascites. The surface of the ascitic fluid may be seen in the fluoroscope if the patient is examined lying on his back, the physician looking through the body transversely.